

Adding and Subtracting Decimals

Goal: Add and subtract decimals.

Vocabulary

Front-end estimation:

A method for estimating the sum of two or more numbers

EXAMPLE 1 Adding and Subtracting Positive Decimals

a. $5.61 + 1.03 + 2$

$$\begin{array}{r} 5.61 \\ 1.03 \\ + 2.00 \\ \hline 8.64 \end{array}$$

Check: Round decimals to whole numbers and

add: $6 + 1 + 2 = 9$.

The answer is reasonable.

b. $4.9 - 2.76$

$$\begin{array}{r} 4.90 \\ - 2.76 \\ \hline 2.14 \end{array}$$

Check: Add 2.14 and 2.76 to see if you get

4.9 . It checks:

$2.14 + 2.76 = 4.9$.

EXAMPLE 2 Adding and Subtracting Negative Decimals

a. Find the sum $-13.2 + (-5.1)$.

$-13.2 + (-5.1) = -18.3$

Add $|-13.2|$ and $|-5.1|$.

Both decimals are negative, so the sum is negative.

b. Find the difference $-3.01 - (-8.275)$.

First rewrite the difference as a sum: $-3.01 + 8.275$.

Subtract $|-3.01|$ from $|8.275|$.

$-3.01 + 8.275 = 5.265$

$8.275 > |-3.01|$, so the

sum has the same sign as 8.275 .

Guided Practice Find the sum or difference.

1. $4.097 + (-1.394)$	2. $-0.48 + 0.6$	3. $-3.25 + (-10.008)$
4. $6.54 - 4.634$	5. $-11.2 - 15.71$	6. $4.265 - (-1.9)$

EXAMPLE 3 Evaluating an Algebraic Expression

Coldest temperature The formula $K = C + 273.15$ is used to convert from degrees Celsius C to kelvins K . The world record for the coldest temperature on Earth is -89.2°C , recorded in Vostok, Antarctica in 1983. What is this temperature in kelvins?

Solution

To find the temperature in kelvins, substitute the Celsius temperature into the equation.

$$K = C + 273.15$$

Original equation

$$K = -89.2 + 273.15$$

Substitute -89.2 for C .

$$K = 183.95$$

Add.

Answer: The temperature in kelvins is 183.95 K.

Guided Practice Use the information above.

7. Suppose a scientist records a temperature of -52.5°C in Vostok, Antarctica. What is this temperature in kelvins?

EXAMPLE 4 Using Front-End Estimation

School You want to estimate the cost of your school supplies. Is the cost of the items shown (excluding tax) more or less than your \$40 budget?

School Supplies	
Notebooks	\$8.19
Pencils	\$2.79
Pens	\$4.39
Backpack	\$23.58

Solution

Use front-end estimation.

1. Add the **front-end digits**: the dollars.
2. Estimate the sum of the **remaining digits**: the cents.
3. Add your results.

\$8.19	\$8.19	}	\$1		\$37
\$2.79	\$2.79	}	\$1		\$2
\$4.39	\$4.39	}	\$1		\$2
<u>\$23.58</u>	<u>\$23.58</u>	}	\$2		\$39
\$37					

Answer: The cost of the items is less than your \$40 budget.

Guided Practice Use front-end estimation to estimate the sum.

<p>8. \$8.99 + \$13.72 + \$3.29</p>	<p>9. \$26.81 + \$11.17</p>
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